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CHRONOLOGICAL NOTES FROM THE ARAMAIC PAPYRI. THE JEWISH CALENDAR. DATES OF THE ACHAEMENIANS (CYRUS–DARIUS II)

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It is now about four years since the first larger collection of Aramaic papyri from the Jewish colony at Assuan-Elephantine was published (A. H. Sayce and A. E. Cowley, *Aramaic Papyri Discovered at Assuan*, London, 1906). They were preceded by a fair number of scraps and fragments of similar origin and import, written upon stone and potsherds, as well as papyrus (cf. "Seymour de Ricci" in Sayce and Cowley, *App.* II., and Lidzbarski, *Ephem.* III, 210 f.), chief among which for the scope of this paper are a memorial stela of a commander in the army of Artaxerxes I (*RES*, No. 438), and the well-known Strassburg or Euting Papyrus. These have been followed by a goodly number of ostraka, and by the Berlin or Sachau papyri (E. Sachau, *Drei aram. Papyrusurkunden aus Elephantine*, Berlin, 1907). A larger number of papyri, etc., are in course of preparation for publication at Berlin.[1] The importance of these finds for our knowledge of the times in which they were indited, of the language in which they were written, of the people from whom and the place whence they proceeded was speedily recognized and has been largely exploited by scholars in Europe and America in many essays and articles. (A list of the most important of these contributions by European scholars is given by W. Staerk in the introductions to his edition—in Hans Lietzmann's *Kleine Texte für theol. u. philol. Vorlesungen und Uebungen* No. 22/23 the Sayce and Cowley papyri, and No. 32 the Sachau, Euting, and Turin papyri.) There is, however, one phase of the evidence of these documents which has scarcely received as much attention as the facts seem to warrant. It is in the Sayce and Cowley papyri especially that the precision and fulness of the dating stands forth as an important factor. In all but one of them the dating is in large measure preserved. In each of these the date is given in years of the king and in the months of the Egyptian as well as the Jewish calendar. And again in all but one of these last the exact day of the month is named according to both systems. As a matter of course it was soon observed that these extraordinarily copious data were very apt to enrich our by no means perfect knowledge of the chronology of those times. In a twofold direction addition to our knowledge might be looked for. New light would almost certainly fall upon the Jewish calendar, the Jewish method of time reckoning, in the fifth century B.C., for which the biblical data are at best but few and scanty, and of which the Talmud and other early Jewish literature has preserved in the main only fragmentary remnants, not always easy of interpretation. And it might reasonably be expected that first-hand documents, so precisely fixed in point of date, would help to fix the chronology of the Achaemenian Persian kings, their reigns, and events occurring in their reigns at points where the documentary evidence, none too full and explicit, had hitherto left difficult questions moot and unsettled (see esp. Ed. Meyer, *Forschungen zur alten Geschichte,* II, 437–502, and compare, e.g., J. V. Prašek, *Forschungen zur Geschichte des Altertums,* I, 18–30). The former of these problems, falling within his own especial province, has been treated with his well-known promptness, thoroughness, and lucidity by the late lamented Schürer in the *Theol. Lit.-Ztg.* (1907), 3, coll. 65–69. For the second, Lidzbarski (*Deutsche Lit.-Ztg.*, 1906, 51/52, coll. 3207 ff.) has found the correct reading for the numerals of the king's years, established the Jewish year's beginning with Nisan, and brought out the fact that Papyrus *SC* B gives Artaxerxes' accession year, not his first year; aside from this, however, he has added little more on the purely chronological side than the cryptic and manifestly faulty statement: "In Aegypten wurde die Zählung nach Xerxes antedatiert (vgl. Ed. Meyer, *Forschungen,* II, S. 487 f.)."[2] In view of this it will scarcely appear a superfluous task to muster these data once more in review and seek to ascertain their meaning.

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[1] Sayce and Cowley papyri, *SC;* the Sachau papyri, *Sachau.* The papyrus of Amyrtaios' 5th year, since published by Sachau in *Florilegium . . . . dédiés à De Vogüé*, 529–38, does not affect the results of this essay.

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[2] The efforts of Billeli and similar ones, if there be any, may safely be ignored. The only reason for naming Billeli at all lies in the fact that he has received mention, though uniformly unfavorable, in journals of high standing.

In the matter of the Jewish calendar of those times, as has been indicated, Schürer has left little undone. But any addition, be it ever so little, with a somewhat fuller elaboration of the evidence, should not be unwelcome in the present state of our knowledge. As the following paragraphs are to deal largely with the three year-forms, the Egyptian, the Jewish, and the Julian, in their relation to each other, a conspectus of them is here given in parallel tables, which, it is hoped, will prove convenient for ready reference to all those readers, however conversant with these matters, who are not professional chronologers and do not constantly work with them. The months as aligned, as a matter of course, correspond only approximately to each other.

EGYPTIAN		JULIAN		JEWISH	
Months	Days	Months	Days	Months	Days
2. Phaophi....	30	1. January....	31	11. Šebaṭ	29(30)
3. Athyr......	30	2. February...	28(29)	12. Adar.......	“
				(13. Adar II)....	(“)
4. Choiak.....	30	3. March......	31	1. Nisan	“
5. Tybi........	30	4. April.......	30	2. Iyyar	“
6. Mechir.....	30	5. May........	31	3. Siwan......	“
7. Phamenoth .	30	6. June.......	30	4. Tammuz ...	“
8. Pharmuthi .	30	7. July........	31	5. Ab.........	“
9 Pachons....	30	8. August.....	31	6. Elul	“
				(13. Elul II?) ...	(“)
10. Payni	30	9. September..	30	7. Tišri.......	“
11. Epiphi	30	10. October	31	8. Marchešwan	“
12. Mesore.....	30	11. November ..	30	9. Kislew.....	“
Epagomenai	5				
1. Thoth......	30	12. December ..	31	10. Ṭebeth.....	“
12 months and 5 days, $\frac{1460}{4}$ or 365 days.		12 months, $\frac{1461}{4}$ or 365¼ days, actually 365 or 366 days.		12 or 13 months, 354/5 or 384/5 days.	

Following the custom of practically all modern historians, when reckoning with the period B.C. of the Christian era, Julian years are chosen in preference to Gregorian years of complicated fractions. Where so much figuring and reducing must be done, the Julian constant of 365¼ days is much simpler to handle. The difference between the two, moreover, is of practically no consequence for our period, the fifth century B.C., amounting to only about 1 day in 128 years. And should occasion require the utmost precision, the reduction from Julian to Gregorian or even to true solar years may then be made much more easily than a reduction in the first place of the various year-forms used in antiquity to Gregorian time reckoning. The historian's method, furthermore, is followed in this also, that the year ending on December 31, preceding January 1, 1 A.D., is counted as the year 1 B.C., the preceding year as 2 B.C., etc., the years B.C. 1, 5, 9, 13, etc., being thus reckoned as leap years (of 366 days), and not the astronomer's method, whereby the year ending December 31, preceding January 1, 1 A.D., is counted as 0, the preceding year as —1, etc., thus making the years 0, —4, —8, —12, etc., leap years.

The Egyptian method of time reckoning is a perfectly well-known and a perfectly regular factor. Leaving aside the naming of the months, which is a later addition, the calendar, as above depicted, was introduced in Egypt in hoary antiquity (according to Ed. Meyer's and J. H. Breasted's brilliant reckoning in 4241 B.C.; this precise date appears somewhat doubtful to Ginzel, *Hdb. d. Chron.* I, 222, and to Lehmann-Haupt, *Klio*, 8, 213–226) and continued in use there, practically without interruption, down to the introduction of the Julian calendar in 46 B.C.[3] The relation of this beautifully conventionalized year with its beautifully conventionalized months, which went on for millenniums in its regular course, paying practically no attention to solar years or lunar months—to the Julian year, wherewith we shall have largely to deal—is clear at sight. The Egyptian year $= \frac{1460}{4}$ days; the Julian $= \frac{1461}{4}$ days. Therefore 1461 Egyptian years $=$ 1460 Julian years. In actual practice the calendar cannot take note of quarter days, but only of $\frac{4}{4}$, i.e., full days. Thus the difference between the Egyptian and the Julian year will not be noticeable every year, but only every fourth year. Each fourth or leap year the Egyptian year will gain one day upon the Julian calendar. If in the year following upon a leap year Thoth 1, the beginning of the Egyptian year, fall exactly upon January 1 of the Julian year, then that Egyptian year and the two following years will precisely equal in length the corresponding Julian years, the last of the Epagomenai = December 31. But in the fourth year thereafter the Julian year will add one day, February 29, whereas the Egyptian year will not. Athyr 29 of that year will = February 28 as before; but Athyr 30 will not be March 1, but February 29, Choiak 1 = March 1, not March 2, and so on throughout the rest of that year the Egyptian dates will have slipped back one day in the Julian calendar, until the end of the Egyptian year is reached, not as before, on December 31, but on December 30, and the Egyptian New Year's Day, Thoth 1, will now fall upon December 31, Julian. This process repeating itself every fourth year thereafter, the Egyptian dates will slip back through the entire Julian calendar year, until ultimately the 1st Thoth of the 1461st Egyptian year will again fall upon January 1 of the 1460th Julian year. Under these conditions it is perfectly clear that, any one Egyptian date being certainly (e.g., astronomically) fixed upon any one Julian date, the position of the Egyptian calendar in its relation to the Julian can easily be computed for any number of years before and after. Such given dates there are, not one only, but several (cf. esp. Ed. Meyer, *Aegypt. Chronologie*, *passim*, and J. H. Breasted, *Ancient Records of Egypt*, I, 25–48). Hence we know beyond the shadow of a doubt that in the period covered by the Aramaic papyri of Elephantine (*ca.* 473–406 B.C.) the beginning of the Egyptian year slipped from December 19 to December 3. (Thoth1 = December 19 from 473–470, December 18 from 469–466, etc.) It is at this point, exactly, that the importance of the chronological data given us in the Aramaic finds from Egypt becomes apparent. What they furnish us for this period is a series of dates according to the Jewish calendar, to which are added their more or less precise equivalents in the easily determinable Egyptian calendar. That this equation of dates in the conventionalized Egyptian calendar with dates, dependent upon astronomical phenomena, in the Jewish calendar is of value for the determination of the chronology of the Persian kings reigning in and before this period, will be shown further on. At present it is the bearing of this evidence upon the Jewish method of calendar making at that time that demands attention.

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[3] The attempted reform under Ptolemy III, Euergetes (247–22 B.C.), recorded in the decree of Canopus, is later than the times with which this paper deals and need not, therefore, be taken into consideration. So, too, the division of the Egyptian year into three seasons of four months each may be ignored as of no consequence for the purpose of this essay.

The Jewish mode of time reckoning at this period is both much less well known, and, so far as known, much less regular and conventional than the Egyptian. A fairly full statement of sources and literature is given in Schürer, *GJV*, Eds. 3 and 4, I, 745–60. Such biblical sources, contemporary or nearly so, as mention months by name rather than by number, supply us with the following list of names: Nisan, Neh. 2:1; Esther 3:7; Siwan, Esther 8:9; (Tammuz is mentioned as the name, not of a month, but of a god, in Ezek. 8:14); Elul, Neh. 6:15; Kislew, Zech. 7:1; Neh. 1:1; Ṭebeth, Esther 2:16; Šebaṭ, Zech. 1:7; Adar, Esther 3:7, 13; 8:12; 9, *passim*. To this list the Aramaic papyri add Tammuz, *Sachau* AB, l. 4; Ab, *SC*, F; Tišri, *SC*, G; Marchešwan *Sachau* AB l. 30. This gives us, with the sole exception of Iyyar, the complete list of the later Jewish calendar above exhibited. None of these names is given in any Jewish document or literary source previous to the Exile. As found in the sources they are simply Aramaized forms of the names in the Assyro-Babylonian calendar. These names must have come into use among the Jews in Egypt, as well as those of Babylonia and Palestine, at about the exilic period, certainly not much before that time.

What sort of months did these names stand for? How was the length of each month, its beginning and end, determined? On this point the biblical evidence, and the direct evidence of the papyri as well, is scanty. The biblical sources do little more than to exhibit a strong tendency to actual observation of the moon's phases in the matter, especially the new moon (חֹדֶשׁ in its twofold meaning, as "month" and "new moon") with much less emphasis on the full moon (כֶּסֶא, Prov. 7:20; Ps. 81:4, and the laws concerning the Passover and other feasts). The name ירח for month, which the papyri have in common with biblical Aramaic and Hebrew and other Semitic tongues and dialects, is not much stronger evidence in this respect than is our "month" or poetic "moon." In another manner, however, the testimony of the papyri is fairly strong and clear. Finding, by the method above indicated, the Julian date corresponding to the Egyptian date given, and leaving for the king's year mentioned a limit of uncertainty within three years (which is certainly all that can within reason be asked for upon paleographical, chronological, or any other grounds), if one consult for the years and months so ascertained the table of new moons in Ginzel, *op. cit.*, I, 547–62, it will be found that in most instances for one of these years the Jewish date given will show the beginning of the Jewish month to have taken place 1 or 2 days after the preceding new moon. Thus:

			Preceding New Moon
SC, A Xerxes 15	Pachons 28	Sept. 12	472, Sept. 4
472–470	Elul 18		*471, Aug. 24*
	Elul 1, Aug. 26		470, Sept. 12
SC, B ⟨Xerxes⟩ 21	Thoth ⟨17⟩		
Artax. acc.	(Cf. Schürer, *Th. Litz., l.c.*)	Jan. 3/2	466, Nov. 26
465–464	Kislew 18		*465, Dec. 14/15*[4]
	Kislew 1, Dec. 17/16		464, Dec. 4[4]
SC, D(+C ?) Artax. 6(?)	Mesore 1	Nov. 11	461, Oct. 31
461–458	Kislew 21		*460, Oct. 20/21*
			459, Nov. 9
	Kislew 1=Oct. 22		458, Oct. 29
SC, E, Artax. 19	Mesore 10	Nov. 17/16	447, Oct. 28
447–445	Kislew 3		*446, Nov. 15/16*
	Kislew 1=Nov. 15/14		445, Nov. 4
SC, F, Artax. 25	Pachons 19	Aug. 26	441, Aug. 23
441–439	Ab 14		*440, Aug. 12*
	Ab 1=Aug. 13		439, Aug. 1/2

(In *SC*, G the date is too fragmentary to be made use of here. If the reference be to Artax. 25, i.e., in all probability 440, as the previous date shows, then the equation of Staerk, Epiphi 6 = Tišri 26, is impossible. For Epiphi 1 fell in this year upon October 7—and the date found for Ab 1, viz., August 13, shows that Tišri must have begun October 11/12, new moon, October 10. The dates for

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[4] The dates here given are translated from the astronomical days, 12 M.–12 M., as given in Ginzel, into the days wherewith we ordinarily reckon, 12 P.M.–12 P.M., the exact hour, minute, second being omitted as in the case of this article an unnecessary hyper-precision. The seeming difference now and then of one day between the dates in Ginzel and here is thus easily explained, e.g., the new moon for Dec. 464 is given by Ginzel as Dec. 3.94. This is about 11 o'clock A.M. of Dec. 4, as ordinarily reckoned. If one read with a more commonly accepted conjecture Thoth <7> for <17>, this would make Kislew 1 = Dec. 6, in the only year possible with this reading, 464. The reading adopted by Schürer is much the more probable, as will be more explicitly shown shortly. The date as given in Staerk, Kislew 18, Thoth 7, Xerxes 21 = Artax I. 1 = 465 is manifestly impossible. In fact most of Staerk's dating for these papyri is atrocious.

Epiphi must thus be 4 or 5 days higher than those for Tišri. Now a date of 20+ being practically assured paleographically for Tišri and a date *ending* in a unit 6 or 9 for Epiphi this leaves the choice between Epiphi 29 = Tišri 24/25 or Epiphi 26 = Tišri 21/22. The date in *SC*, H is not sufficiently exact for use at this point.)

SC, J, Darius II 8 Jewish	Thoth 12	Dec. 17/16	418, Dec. 6
⟨9⟩ Egyptian	Kislew 3		417, Nov. 24
418–416	Kislew 1 =	Dec. 15/14	*416, Dec. 12*
SC, K, Darius II, 13 Jewish	Athyr 9	Febr. 10	412, Feb. 6
14 Egyptian	Šebaṭ 24		411, Jan. 27
412–410	Šebaṭ 1 =	Jan. 18	*410, Jan. 16/17*

There are six (seven, if C be counted separately) papyri (A, D [+C], E, F, J, K) in which no serious lacuna makes doubtful what the scribe actually wrote in the dating. For all six of these there is one of the 3 or 4 years examined, in which the beginning of the Jewish month dovetails fairly well with the date of the preceding new moon. In only one case, D (+C), does the year so found cause real, though not at all insurmountable, difficulty. B and G can be brought into line by conjectures not at all violent or improbable, fitting well enough into the lacunae and taking due account of the fragments remaining. In five of the six unquestionable cases the date found lies from 1 to 2 days after the actual new moon. In B and G the conjectures suggested lead to a similar result. Now 1 to 2 days after the actual new moon, which is, of course, invisible, occurs what is popularly called the "new moon," the חֹדֶשׁ, the first visible appearance of the newly waxing moon (cf. Ginzel, *op. cit.*, p. 93; Weissbach in *Hilprecht Ann. Vol.*, pp. 281–90). As a rule, then, in these papyri the beginning of the month coincides with the "new moon," the first visible appearance of the newly waxing moon. This is probably what determined the beginning of the month, as it did in Babylon at this time (cf. Ginzel, *op. cit.*, pp. 92 f.), and as it did among the Jews in Palestine for some centuries later (cf. the tractate *Rosh Hashanah* in the Talmud; Mahler, *Bibl. Chronologie,* 67 f.; Schürer, *GJV*, I, 750). The Jewish month, then, was not a pre-established, fixed quantity, like the Egyptian or ours. It was fixed, so to speak, on the spur of the moment. If the "new moon" appeared on the thirtieth day of a month, then this day was taken away from this month, leaving it defective (29 days), and became the first day of the next month. If the new moon did not appear on the 30th day, the month was a full month (30 days), and the following day was the first of the next month. This was the rule. But there was an exception (Papyrus E, Kislew 1 = the actual, invisible new moon). This exception is quite what might be looked for. There would be times, even in Egypt, when the appearance of the new moon would be obscured by dust, mist, clouds. Such a contingency was not at all unlikely in Egypt in the middle of November, the time when E was written. In such an event the first of the month would have to be calculated or guessed at. The date in E looks rather like a rough guess. In any case the exception rather tends to prove the rule than otherwise. The Jewish months of those times were true lunar months (i.e., lunations), not fixed with modern, scientific precision, and yet, because resting upon actual observation, corresponding fairly well to the exact measurements of modern instruments and reckonings. Now, the so-called synodical month, the time between one actual new moon and the next, is 29 days, 12h. 44m., 2.9s. This means that by the methods above outlined the Jewish months would alternate with fair regularity between 29 and 30 days, with now and then two 30-day months following upon each other. Within a twelvemonth there could scarcely, except by gross and unlikely error, be less than 6 or more than 7 30-day months. The statement of the Talmud (cf. Schürer, *GJV*, *loc. cit.*) that there may be 4–8 of either and other similar statements are either mere theoretical quibbles or the result of ignorance, or both. The twelve-month lunar year (if such a thing as a "lunar year" may be spoken of) would consist of 354/5 days (actual lunar twelvemonth 354 days, 8h., 48m., 36s. For this and the lunar month cf. Ginzel, *op. cit.*, I, 36).

The discrepancy between this lunar twelvemonth and the (tropical, solar) year (variable, *ca.* 365 days, 5h., 48m., 46s., cf. Ginzel, *op. cit.*, 32) is apparent at a glance. This was quite as apparent to the Jew of Persian (and much earlier) times as it is to the ordinary man today. Unless he lived in Egypt, the year of 365 days may not have been a matter of as common knowledge to him as it is to modern men. But he knew quite well that his lunar twelvemonth was not a year, fell from 10–11 days short of being a year. His year was not a "lunar year." In fact, there is no such thing as a "lunar year," and it is highly probable that no people ever attempted to live with such an impossible institution except those for whom it was artificially created and upon whom it was inexorably forced by the none too intelligent but cast-iron rule of Mohammed's Quran (cf. Ed. Meyer, *Forsch.* II, 438; *GA*^{2} I, 1, 237). The year whereby any people, nomadic, agricultural, or commercial, who have learned to measure time at all, will naturally reckon, is that space of time represented by the regular revolution of the seasons determined by the sun (cf. Ginzel, *op. cit.*, 91). The time of new grass for the herds, the time of the melons (so a woman of Arṭâs, near Bethlehem, in 1909 dated for us the birth of her babe), the time of sowing and harvest, the time when travel and shipping was safe, the time when kings went forth to battle, etc., these are the things that count in the life of a people and that determine their reckoning of the year. This was the case with the Egyptians, whose conventionalized calendar, slipping back only 15 days in 60 years, a hardly noticeable shift within the lifetime of the individual, for all practical purposes represented this natural year. This was no less the case with the Greeks and Babylonians in spite of their lunar months. And the Jews were no differently situated in this respect than these other peoples. Their year too was the natural solar year. All the biblical evidence points this way. This much, at least, may safely be deduced from the Gezer Calendar, *PEF*, QS, 1908, p. 271; 1909 *passim*, and the testimony of the papyri is clear. Most of those above examined have given us the date for Kislew 1. It is easy to deduce the same date from the others. Thus in 471 the third new moon after Elul 1 = August 26, must have become visible November 22/23, in 440 the fourth new moon after Ab 1 = August 13 on December 9/10, 411/10 the second new moon before Šebaṭ 1 = January 18 on November 19/20. This gives us in order the following dates for Kislew 1: November 22/23, 471; December 16, 465; October 22, 460; November 15, 446; December 9/10, 440; December 14, 416; November 19/20, 410. The limits of variation in these dates are wide, between October 22 and December 16. Yet Kislew does remain within these limits, roughly *within the limits of the same season* throughout. It does not, as it would in the Mohammedan lunar year, regularly and constantly slip back 10–12 days in the calendar each year, thus making a complete circuit of the seasons in *ca.* 33 years. The Jew of this place and period kept his months, however roughly, within their proper seasons. This is proof conclusive, if such proof be needed, that his year was not the lunar twelvemonth, but the revolution of the seasons, the solar year.

The means whereby he kept his months thus roughly constant were, of course, the same as those used by the other peoples of those times, who like him had lunar months and solar years to deal with, e.g., Babylonians and Greeks. About every third year he would notice that his months had slipped back about the length of a month in the seasonal year, and would supply this deficiency by inserting an extra month, a 13th month. Two questions are of interest and importance in regard to this process of intercalation: (1) How regular, how systematic was it? (2) At what point of the year did it take place?

On the first point the evidence of the documents is unmistakable. Before proceeding to the unfolding of it, we may at this point add the data of two further documents. The first is the stela, *RES*, No. 438. This is dated in Siwan = Mechir, 7th year of Artaxerxes I. Proceeding in a similar manner as above, we find:

Artax. I, year 7		Egyptian Month	Possible Jewish Months
459 or	Mechir	May 15–June 13	April 18–May 16/17 *May 17/18–June 16/17*
458 or		May 15–June 13	*May 6/7–June 4/5* June 5/6–July 4/5
457		May 14–June 12	April 24/25–May 23/24 May 24/25–June 22/23

On grounds to be developed later, it is most probable that the month meant is May 6/7–June 4/5, 458. For the present purpose the choice may be left open between this and the next in probability, May 17/18–June 16/17, 459. The other additional document is *SC*, Papyrus H, dated Elul = Payni, Darius II, year 4.

King's Year	Egyptian Month		Possible Jewish Months
421		Sept. 2–Oct. 1	Aug. 13–Sept. 10/11
or			Sept. 11/12–Oct. 10/11
420	Payni	Sept. 2–Oct. 1	*Sept. 1–29/30*
or			Aug. 21–Sept. 18/19
419		Sept. 2–Oct. 1	Sept. 19/20–Oct. 18/19

September 1–29/30, 420 is by all odds the most probable and may be set down as sufficiently certain to be used here. In this case, too, it is easy to find the beginning of Kislew, as the third "new moon" thereafter, November 29 (30). The reduction to Kislew 1 is made, wherever feasible, because of greater ease and simplicity in the following exposition. The date of the stela is left in its original form because of some uncertainty at this point still attaching to it. Should anyone wish to he may with little trouble follow out the reckonings about to be undertaken with the original dates throughout. Taking now the series of dates ascertained and the table of new moons in Ginzel to show the number and position of the Jewish months throughout the 60 odd years covered by these dates, it is easy to measure the distance from one to the other both in years and in months. Between Kislew 1 = November 22/23, 471 and Kislew 1 = December 16, 465, lie 75 lunar months within a space of 6 years. It is evident that 3 of these years must have had 13 months. In exactly which of these years intercalation was made, there is but little evidence. In view of the fact that, as we shall see presently, for four years thereafter no intercalation took place, the extremely late Kislew in 465 makes it highly probable that either an Elul II in this very year (this would save Nisan from falling inordinately late, April 23/24) or, less probably, an Adar II in the previous year had been added. As to the other two intercalations it can only be said that if the growing defectiveness of the year was overlooked between Nisan 1 (March 22/23), 470 and the end of Adar (March 8/9, 469), it could not fail to be noticed in the following year. Similarly 467/6, or in case this was overlooked, certainly 466/5 would demand intercalation. Between Kislew 1 = December 16, 465 and Kislew 1 = October 22, 460 lie 60 lunations within the space of 5 years, making exactly 5 twelvemonths. Between these two Kislews there is absolutely no intercalation. Reckoning the

year from Nisan–Adar there are four defective years in succession. As it was highly probable that 465/4 had been a year of intercalation, so it is highly probable that 460/59 could not but receive an added Adar (February 17/18 – March 18/19, 459), for it is scarcely possible that Nisan should ever have been so early. The date of the stela, *RES*, No. 438, whether we take it, as is most probable, to be Siwan = May 6/7–June 4/5, 458, or as Siwan = May 17/18–June 16/17, 459, shows conclusively that this intercalation at the end of 460/59 took place, but no other between it and the stela, unless, as is quite improbable, the Siwan of the stela be June 5/6–July 4/5, 458. Upon this basis it is fairly safe to say that 460/59 an Adar II was added; it was a leap year, and 459/58 was not—was a defective year, without intercalation. The next given date is twelve years later, Kislew 1 = November 15, 446. Reckoning from the most probable stela-dates, Siwan = May 6/7–June 4/5, 458, the sixth lunation thereafter, October 30/31–November 28/29, is Kislew, 458. Between October 30/31, 458 and November 15, 446, lie 149 lunations for 12 years, necessitating five 13-month years, as to the exact location of which little can be said, except that the apparent defectiveness of 458/7 makes it probable that this year or, if not this, then certainly 457/6 must have received intercalation, whereas the rather normal position of Kislew, etc., in 446 makes it improbable that it was a leap year. The space between Kislew 1 = November 15, 446 and Kislew 1 = December 9/10, 440, is much like the first, an interval of 6 years, for which 75 lunations demand three intercalations. The position of Ab in 440 makes it practically certain that no intercalation (e.g. by Elul II) could have taken place in 440/39 and that it must have been made in the previous year 441/40. The next date, as computed above, makes Kislew 420 begin November 29/30. For the interval of 20 years between this and the foregoing date 247 lunations demand 7 intercalations; 420/19 does not seem to have been a leap year. Within the next four years, before Kislew 1 = December 14, 416, two intercalary months must have been inserted, as the intervening 50 lunations show. The following 5 years, up to Kislew 1 = November 19/20, 411, show 61 lunations with but one intercalation. Thus we have, figuring the years from Nisan–Addar:

Probable Embolismic Years	Number of Embolismic Years	Period	Number of Non-embolismic Years	Probable Non-embolismic Years
		Nisan (March 31 or April 1)		*471/0*
	3	471	4	
		│		
		ult. Adar (April 11/12)		
465/4 (Elul II)		464		
		Nisan (April 12/13)		*464/3*
		464		*463/2*
		│		*462/1*
	1	│	4	*461/0*
460/59		ult. Adar II (March 18/19)		
		459		
		Nisan (March 19/20)		
		459		
	1	│	1	459/8
458/7		ult. Adar II (March 25/26)		
		457		
		Nisan (March 26/27)		457/6
		457		
	4	│	8	
		ult. Adar (March 13/14)		446/5
		445		
		Nisan (March 14/15)		
		445		
	3	│	3	
441/0		ult. Adar (April 5/6)		*440/39*
		439		
		Nisan (April 6/7)		439/8
		439		
	7	│	13	
		ult. Adar (March 25/6)		420/19
421/0		419		419/8
418/7		Nisan (March 26/27)		417/6
		419		
	2	│	2	
		ult. Adar (April 10/11)		
416/15 (Elul II)		415		
		Nisan (April 11/12)		*415/4*
		415		414/3
413/2	1	│	3	
		ult. Adar (March 27/28)		412/1
		411[5]		
Total	22	60	38	

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[5] Since there is no means of deciding whether 411/0 had or had not an Adar II (March 17/18–April 15/16, 410) added to it—though the probability is that it had not—this year is left out of the reckoning.

Of a system or cycle (8-year or 19-year) there is no trace. In fact, the astonishing number of four non-embolismic years in succession (464/3–461/0), practically assured even though one assume for Pap. *SC*, B, the almost impossible date 464/3, makes it almost certain that the Jews in Persian times had no such cycle, any more than did the Jews of Jesus' time (cf. Schürer, *GJV*, 3/4, I, 751 f.). And—if this slight digression be permitted—this rather makes for Weissbach's view, that the Babylonians of this time had no such system or cycle, at least not in general, popular use (cf. *Hilprecht Ann. Vol.* 281–90, where Weissbach finds that an attempt at reform of the calendar in this direction proved abortive in the last third of the sixth century B.C., and that the 19-year cycle was not introduced until 381 B.C.+). It would, of course, not be safe to base such a view solely upon the conclusion from the Jewish to the Babylonian. But now that the tests of Weissbach (l.c.), Ginzel (*op. cit.*, 132 f.), *et al.*, have rather shaken the findings of Mahler (in many well-known writings) and Ed. Meyer (*ZA*, IX, 325 ff.), the failure of the Jews to receive with the calendar they borrowed from the Babylonians after the time of Nabonassar (747–734 A.D.) any 8- or 19-year cycle or system of intercalation is an added bit of evidence, going to show that at this time the Babylonians probably had no such system. Or may the experience of Meton among the wide-awake Greeks of classical times suggest a resolution of the difference between Weissbach and Mahler? The reform of Meton, though made in 432 and recognized in the scientific world of his day, was not adopted for popular use in Athens until much later (342/1; cf. A. Schmidt, *Griech. Chronologie*, 622). The contemporary popular opinion of the improvement is well expressed in the proverbial expression ἀναβάλλεσθαί τι εἰς τὸν Μέτωνος ἐνιαυτόν (*Paroemiographi Graeci*, ed. Leutzsch & Schneidewin, I, 433: *App.*, *Cent.* III, 88.). If this was the popular feeling and the resulting course of events in regard to such matters among the Greeks of this time, is not a similar development possible and even highly probable for Babylon?—As to the point at which an intercalary month was inserted within the year, there is no direct evidence. But there is strong evidence in regard to the month and season which the Jews of that time thought of as the beginning of their year. Now this in itself is of little importance, is in fact an almost purely arbitrary convention, as is shown by the differences on this point not only among ancient, but also among modern peoples. The Babylonians and Assyrians in the period of which we have clearest knowledge began their year at about the vernal equinox; most of the Greeks at the autumnal equinox; the Romans at about the time of the winter solstice; the Egyptians wherever within the seasons their revolving year happened to fall; and in our own day the peoples still using the Julian calendar celebrate their New Year's Day on January 14. And that our winter solstice is not a New Year especially arranged by Providence is clear, when we remember that in that case the New Year of our friends south of the equator would differ by six months from ours, and that the unfortunates living directly upon the equator would have no New Year at all. Moreover, the point at which a people begins its year has no necessary connection with the point at which they make their intercalation. The Babylonians, though for a long time there was no question in their minds as to the year's beginning with Nisan, inserted their additional month sometimes after Elul, sometimes after Adar, and a few times, possibly, even after Nisan. And we are accustomed to make our insertion at the end of our second month, foreshortened to this end by the decree of long-dead Roman Caesars. Nevertheless, the finding of the Jewish year's beginning as the people of that time conceived it is of considerable importance for the conversion of dates in Persian (or other) kings' years to years B.C., which is presently to be undertaken. And not only that, but, in connection with the Jewish feast-calendar, especially the date of the Passover, it will show with some likelihood, even if it do not conclusively determine, the point or points at which the Jews did or might insert their intercalary month.

Now in regard to the point at which fell the Jewish New Year, the Assuan papyri give unmistakable evidence, as Lidzbarski, (*Deutsche Lit.-Ztg.*, 1906, 51/52, coll. 3207 ff.) has seen and well set forth. Papyri J (cf. Lidzb., *loc. cit.*) and K show the Egyptian New Year to be ahead of the Jewish; for when with Thoth of the [9th] and Athyr of the 14th year of Darius II, the new Egyptian year has already begun, the Jews are still counting Kislew of the 8th and Šebaṭ of the 13th year respectively. But for Elul-Pachons, Xerxes 15, and, for Ab-Pachons, Artaxerxes I, 25, for Elul-Payni, Darius II, 4 (Papyri A, F, H), and for Siwan-Mechir, Artaxerxes I, 7, (*RES* 438) the years are alike, the Jewish year has caught up. The Jewish New Year must have fallen between Šebaṭ and Siwan. The date in B, which equates Thoth and Kislew with no difference in the year, does not invalidate this conclusion. It is an exceptional case anyway, in that it is the only one of our documents to fall within an accession year, and the scribe would not be likely further to encumber an already cumbersome designation for this year by adding to it a different designation for the Egyptian date. In fact the exact point at which the year's beginning fell is indicated by the formula ראש מלוכתא in this papyrus. This formula, which has an important bearing on the chronology of the Persian kings also, is the precise equivalent of the Assyro-Babylonian SAG-NAM-LUGAL-E, reš šarruti. This is the formula, not, as Staerk in his edition of the Papyri, p. 10, says, for the first year of Artaxerxes I, but as the writer of the papyrus distinctly says, for the fag end of the predecessor's (Xerxes I's) twenty-first year, which runs to the next Zagmuku or New Year's festival, the first of Nisan. Our papyri know no other beginning of the Jewish year than that with Nisan. This is the New Year of Babylon and Assyria, and very probably that of Persia also (cf. Prašek, *Hilprecht Ann. Vol.* 14–19), in short of the Persian, as well as of the Assyrian and Babylonian Empire. And this is quite in line with the Old Testament evidence as well. For the overwhelming majority of the passages dealing with these matters throughout the Old Testament, there is no question on this point. The expressions צאת השנה, Exod. 23:16, and תקופת הש״, Exod. 34:22, often cited to prove an older New Year on Tišri 1 are at best highly doubtful quantities. They may on the one hand be balanced by the expression תשובת הש״, II Sam. 11:1; I Kings 20:22, 26; I Chron. 20:1; II Chron. 36:10; and on the other hand it is rather more than probable, as Eerdmans, *Th. Tijds.* 39:454 f., and Lotz, *PRE*^{3}, *s.v.* "Jahr," are virtually agreed, that these are simply inexact, popular expressions, not dealing with the calendaric year at all. A real difficulty, however, lies in Neh. 1:1; cf. 2:2. Here Kislew and *the following* Nisan are both counted as belonging to the same year, Artaxerxes I, year 20. This would seem to make for Ed. Meyer's assumption, *Forsch.* II, 485, that here Nehemiah dates his years from the actual beginning of Artaxerxes' reign, not from a New Year=first Nisan, or that he here dates, as Herodotus, III:67, is supposed to do, by years according to Persian fashion, beginning with the autumnal equinox, i.e., Tišri. But the Herodotus evidence is doubtful and does not suffice to show such a method among the Persians (cf. Prašek, *loc. cit.*). And for the Nehemiah passages at least three other possibilities than those above mentioned must be reckoned with. It may indeed be (1) that he deals with a Persian year-form, beginning in the autumn, or (2) that he counts by actual years of the king's reign, beginning on or before Kislew. But it may also be (3) that the Jews at this time instituted the later "civil year" beginning Tišri 1, or (4) that a scribe or editor of some later time, when this institution obtained, made the "correction," or (5) that it is simply a scribal error. No. 1 has been dealt with; (2) seems highly improbable in the case of a man who, like Nehemiah, must have been well acquainted with the customs in vogue in Babylon and elsewhere in the Semitic and especially the Aramaic-speaking portions, at least, of the Persian Empire. Of (3) there is not a shred of real evidence elsewhere. This rather leaves (4) and (5) to choose from. And, whatever may be said of Babylonia in the most ancient times, for the Jews, at least, from the earliest times of which we have record down through the Exile and a large portion of the Persian period, all the available evidence seems to point clearly to a year-form beginning with the vernal equinox. The Jewish "civil" year beginning with first Tišri is almost certainly an institution of Greek (Seleucid?) times, later than Alexander.

Saying that we know the Jewish year to have begun with Nisan is not saying that we can fix the absolute date of this beginning for every year with certainty. There will be a limit of uncertainty of a day or two in most cases, and of a month in some. But although this point cannot be established with the same degree of precision as some of the preceding, there is some evidence in this direction also. In the first place the beginning of the year would, as a matter of course, be kept as near the vernal equinox as possible (although this would not be as precisely fixed as in modern times). In the second place there is no good reason why these Jews in Egypt should not have celebrated their Passover on the fourteenth (i.e., the full moon) of Nisan. There is moreover a rule, mentioned by Anatolius (Euseb., *H.E.* VII, 32, 14–19), the Talmud (*Tos. Sanhedrin,* C II), and Josephus (*Ant.* III, 10, 5) whereby the Passover should occur when the sun stands in Aries (*ca.* March 21–April 21, present dating), i.e., practically on the first full moon after the vernal equinox (which fell in the period of the papyri on March 26–28, Julian). This rule has the ring of Babylonian loan material, especially in the mention of the signs of the zodiac. Now, why should not these Jews have appropriated this at approximately the same time at which they were borrowing so much calendaric material from Babylon, i.e., before the period of the Assuan papyri? If so, this would give us a fairly fixed point for the middle of Nisan and therewith, of course, for its beginning also. How does the testimony of the papyri agree with this? Schürer (*Theol. Lit.-Ztg., loc. cit.*), has computed from them, by the simple process of counting back a sufficient number of months, the following Passover dates: April 12, 471; May 6, 465; March 13, 460; April 6, 446; April 30, 440; May 4, 416; April 10, 411—four errors (numbers 2, 3, 5, and 6) out of seven cases, three of them bad ones. But the case does not seem to me necessarily as bad as this. No. 5 is not so bad as to be impossible, the crudeness of the methods of observation in those times being considered. For No. 3, indeed, there appears to be no remedy. But Nos. 2 and 6 may easily be remedied by the simple expedient of assuming the insertion of an Elul II in those years. This makes it seem to me altogether probable that an Elul II, also, to be inserted upon occasion, was among the calendaric material originally received by the Jews from Babylon, although later (possibly through the growing importance of a rabbinically precise Passover date) this feature was dropped. The following fuller elaboration of more or less probable 1 Nisan and Passover dates, on the basis of the material given above, counting not only backward, as did Schürer, but forward also, and computing for the intervening years of the shorter intervals as well, will, I think, make this probability more apparent. A margin of error of a day, forward and back, should, of course, be allowed.

Nisan 1	Year	Passover
March 31	471	April 13
March 21	470	April 3
March 24 (+Elul II)	465	April 6
April 12	464	April 25
April 2	463	April 15
March 22	462	April 4
March 11	461	March 24*
March 1	460	March 15*
March 19	459	April 1
March 8	458	March 22*
March 26	457	April 8
March 15	456	March 27
March 25	446	April 7
March 14	445	March 27
March 29	441	April 11
April 17	440	April 30*
April 6	439	April 19
March 27	438	April 9
March 18	421	March 31
April 6	420	April 19
March 26	419	April 8
March 16	418	March 29
April 3	417	April 16
March 24 (+Elul II)	416	April 6
April 11	415	April 24
March 31	414	April 13
March 19	413	April 1
April 7	412	April 20
March 28	411	April 10
March 17	410	March 30

There are, figuring on the basis of the vernal equinox dates above given, only 4 errors in 30 cases (those marked*), and only one of these (460) too bad to be explained on the ground of crude methods alone. So much for the Jewish calendar of these times.

The second subject to be dealt with in this paper is the contribution of the Assuan papyri and related material to the exact determination of the chronological succession of the Achaemenian kings. The only statement to my knowledge in all the prolific literature called forth by these papyri, even so much as touching upon this point, is Lidzbarski's faulty statement mentioned above: "In Aegypten wurde die Zählung nach Xerxes antedatiert (vgl. Ed. Meyer, *Forschungen*, II, S. 487 f.)." The statement is not very clear. From the context, however, it may be gathered to mean that for the dating of documents, etc., during the reign of Xerxes I the antedating method was employed. Now, in the first place, this is not what Meyer says, least of all in the place quoted, pp. 487 f. He is not speaking there of dating in contemporary documents like the Aramaic papyri at all, but of the dates of Manetho. These, as reconstructed at the top of p. 488, correspond exactly (except for the manifest error December 1 for December 3, 405 as the closing date of Darius II's reign) for Darius I–Darius II to the dates of the Ptolemaic canon as given in the table facing p. 457. And of these chronographers, Babylonian as well as Egyptian, and their lists, Meyer says, pp. 475 and 485, that they postdate for Cyrus and Cambyses, antedate (eliminating Smerdis) for Darius I and Xerxes I, then postdate again for Artaxerxes I and Darius II. For such contemporary documents as he had, Egibi tablets and Murašu tablets, Vol. IX, Artax. I, he assumes postdating for Cyrus, Cambyses, Darius I, and Xerxes I, then antedating for Artaxerxes I and Darius II, of which latter's reign he had no documents at all in hand (pp. 483–85). In the second place, simply to apply Meyer's results, arrived at upon the basis of less good and less full evidence to new, first-hand material is faulty method. The correct method is to test and re-examine the results of Meyer *et al.* at the hand of the newer and better documentary material. Such re-examination is what the following paragraphs propose to undertake.

The manifest slip in these matters of so able a man as Lidzbarski and the palpable uncertainty of Staerk in his datings make it seem the more desirable in writing for a wider circle of readers to preface the presentation of the material itself by a brief restatement of the conditions and the materials wherewith this examination will have to deal, and of the fundamental principles according to which it should proceed. We, the spoilt heirs of a method of time reckoning in terms of the Christian era, which makes it perfectly easy, by a few strokes of the pen, to indicate precisely any number of years preceding or following our own day, have, many of us, given little thought to the millenniums of laborious effort, to the many less successful attempts which preceded the opening of this "royal road." It is not as widely known as it should be, that the custom of dating backward as well as forward from the conventionally accepted year of Christ's birth did not become established until the latter part of the eighteenth century A.D. (cf. Meyer, *GA*^{2}, I, 1, 240). The method of dating by means of an era at all is not so old as is commonly supposed, the first such era to come into common use being probably that of the Seleucids, beginning 312/11 B.C. For the Roman "A.U.C." and the Greek Olympiad era are exploded idols of a past generation (cf. Meyer, *op. cit.*, 239 f.), and the oft-mentioned Babylonian era of Nabonassar (beginning 747 B.C.), though used after a fashion by astronomers, as the Ptolemaic canon shows, was never put into practical everyday use. The need of fixing, of naming, of determining a greater or less number of years, past or future, with relation to each other and to the present, made itself felt, of course, from the most ancient times, wherever records or chronicles were kept, when treaties were concluded, when contracts were made, when history began to be written, etc., etc. But how difficult so progressive a people as the Greeks found it to fix any one date in the constant flow of time even as late as the sixth century B.C. is well illustrated by the treaty between Elis and Heraea, which was dated *συμμαχια κ' εα εκατον ϝετεα, αρχοι δε κατοι*, "for 100 years, to begin in the present year" (cf. *CIG* 11; Meyer, *Forschungen*, II, 440, 4; *GA*^{2}, I, 1, 238), about as effective a scheme as that used by the good burghers of Schildburg, when they cut a notch in their boat's rail to fix the location of their church bell, sunk in the lake to prevent capture by the enemy. Better schemes, however, had been invented earlier than this. The first method, to our knowledge, upon which men hit to meet this need, was to name some year after any event out of the ordinary occurring in it, and to count by this year until the intervention of the next event of this kind (e.g., years of earthquakes, of eclipses of sun or moon, of the *διάβασις* of Xerxes, of the battle of Marathon, etc., etc., just as we sometimes date by the Chicago fire or the Johnstown flood, etc.); indeed, the Babylonians of Hammurabi's time named each year after its most prominent event (cf. King, *Letters and Inscr. of Hammurabi*, III, lvi ff.; *Studies in Eastern History*, II, ch. vii). When this method eventually proved its inefficacy the next expedient to be tried was, to name each year or a number of years together after some person of prominence whose name might naturally suggest itself or be artificially connected with it. Thus in Assyria years were named after persons especially designated as the eponymoi of each year, in Greece after archons, ephoroi, strategoi, etc., in Rome after consuls. In countries under monarchical government, the name of the sovereign would easily connect itself with the years of his reign. One or both of these methods then remained in use until the adoption of the era-method, the beginnings of which are sketched above. It is the latter of the two methods which prevails in the Aramaic business documents from Elephantine and in the cuneiform business documents, related to them, of Persian times from Babylon and its neighborhood (chiefly the Egibi and Murašu contract tablets).

The chief difficulty about this method lies in the fact that kings are not in the habit of dying either on precisely the same date as their predecessors or exactly at the end of the year as their merchant, artisan, and peasant subjects are wont to reckon the year as ending. This makes it highly impracticable to date either a chronological canon (like the Ptolemaic) or business or official government documents by actual years of a king's reign. Thus in the case of a contract to run for several years made in the last year of Artaxerxes I, the unfortunate parties would have to reckon with a new year's beginning at the accession of Xerxes II, which probably did not correspond precisely to that of his father, then after 1½–2 months another new year-form would be introduced by Sogdianus, and after 5–6 months still another by Darius II. It is worthy of note that among modern nations England still clings in its official documents to this cumbersome relic of remote antiquity. Most progressive ancient nations soon found means to rid themselves of this encumbrance by one of two ways. Some *antedated*, i.e., counted the year in the course of which a king came to the throne as his first year, as his in full from the beginning of the civil year, ignoring the fraction which might fall to his predecessor. This method prevailed in Egypt under the Twenty-sixth Dynasty (663–525), the dynasty preceding Persian rule. Others *postdated*, i.e., gave the year in the course of which a king died to him in full, practically ignoring the remaining fraction which fell to the successor, and dating the first of the successor's reign from the following New Year's Day. This was the method prevailing in Babylon from very early times, in connection with the now well-known custom whereby one could become rightful King of Babylon only by entering the temple of Bel (Marduk) on Nisan first (Zagmuku, New Year's Day), and seizing the hands of the god's statue.

Now obviously the first thing to do in determining the dates of documents like the Assuan papyri or the Murašu tablets and in using them to determine the dates of a king or a series of kings, is to ascertain which one of the above methods is used in the dating. Then a fixed point or several fixed points (preferably, if possible, such as are astronomically fixed; in default of this, such as are fixed, e.g., by parallelism with other well-known dates) must be looked for. And finally, for a whole series of kings or for a long stretch of years, it is important to ascertain what lacunae, if any, are present. Eponym lists or lists of monarch's reigns are of value precisely in proportion to their completeness.

In regard to the first point there can be no manner of doubt in regard to the Egibi tablets (Cyrus–Xerxes); cf. Meyer, *Forschungen*, II, 462–79, 483–85. They postdate throughout. There is just as little reason for doubt in regard to the method pursued by the Aramaic papyri (Xerxes–Darius II) and the Murašu tablets (Artaxerxes I and Darius II). Lidzbarski's statement notwithstanding, *they postdate throughout.* True, Meyer, having only the Murašu tablets for Artaxerxes I (cf. *loc. cit.*, 466), assumed on the basis of a slightly misunderstood statement of Hilprecht's (cf. p. 483) and in accordance with the general scheme as by him reconstructed, that this was not the case. But now we have documents which show beyond question that Meyer was mistaken in this assumption. We have in Papyrus B (cf. above) the formula for the accession year of Artaxerxes I (equated with Xerxes' 21st year), which Meyer supposed did not exist. And we have in Clay's edition of the Murašu tablets for Darius II's reign (*The Babylonian Exped. of the Univ. of Penn.*, Series A, X, 1904) *six* tablets from the accession year of Darius II (the regular formula SAG-NAM-LUGAL-E, equated in No. 5 with Artaxerxes' 41st year), which Meyer likewise supposed did not exist. The assured dates (from Papyri E, F, H, J, and K) in the reigns of Artaxerxes I and Darius II found above show precisely the same thing. This makes it practically certain that the somewhat less assured dates follow the same scheme. It is this scheme which makes the dates Thoth 17 = Kislew 18 = January 2, 465 for Papyrus B, the fifth year of Artaxerxes instead of the scribe's sixth in D (and C), and Mechir = Siwan = May 15–June 4/5, 458 for the stela, *RES*, No. 438, almost as certain as the other dates. Moreover we know that Cambyses' years were reckoned in Egypt in contemporary documents precisely as they were reckoned in Babylon, i.e., by the postdating system (cf. Wiedemann, *Gesch. Aegyptens*, 219). Now why, in the face of all this evidence, one should assume that the two Xerxes dates alone in Papyri *SC*, A and B follow a different method from their cuneiform brethren (many of which themselves have Aramaic dockets), unless it be under the influence of a preconceived set of dates, is really quite unintelligible. Such juggling with dates as Meyer assumes the Babylonian chronographers and the Ptolemaic canon to have done in the case of Darius I and Xerxes is not inconceivable in the case of chronographers or of the compilers of purely artificial chronological lists; but that such things were done in contemporary documents representing the transactions of everyday life may not be assumed except for the very gravest reasons, and Meyer himself is far from assuming this to be the case (*Forsch.* II, 484). The simple fact of the matter, of course, is that all the known contemporary documents with which we have to deal, those in Meyer's list (*Forsch.* II, 464–66) and those which have since been added in the Aramaic papyri and in the Murašu tablets of Darius II's reign (Clay, *op. cit.*) as well, follow the postdating method, and our determination of dates from this material must follow, not precede, this finding.

For such determination of dates it is necessary, first of all, to find, if possible, one or more fixed points in the series of kings' reigns furnished by the documents in question. One of the best of these is the eclipse of the moon, for which the Almagest and the cuneiform tablet, Strassmayer, *Cambyses*, No. 400, offer us the date Tammuz 14 = Phamenoth 17/18 of Cambyses' 7th year = July 16, 523 (cf. Meyer, *Forsch.* II, 455). Nearly, if not quite, as certainly established is the very beginning of the period with which this inquiry deals, the Achaemenid-Persian rule over Babylon; Cyrus captures Babylon Tišri

16 (*ca.* October 10), enters in triumph Marcheŝwan 3 (*ca.* October 27), 539. The remainder of 539, therefore, is his accession year; his first year begins Nisan 1, 538. At the other end of the series, as furnished by the documents under consideration, we have the dates of the Aramaic papyri, to which the equation of the conventionalized Egyptian dates with the astronomically determined Jewish dates gives an element of astronomical certainty and fixity. From these we derive the following: Xerxes, 15th year = December 19, 472–December 18, 471, Egyptian, Nisan 1, 471–Adar 29/30, 470 Jewish-Babylonian; Xerxes, 21st year = Artaxerxes I, accession year = Nisan 1, 465–ult. Adar, 464; Artaxerxes I, 5th year = 461/60 Egyptian, 460/59 Jewish-Babylonian; *idem* 7th year = 459/58, Egyptian, 458/7, Jew.-Bab., *idem,* 19th year = 447/6, Egyptian, 446/5 Jew.-Bab.; *idem,* 25th year = 441/0, Egyptian, 440/39 Jew.-Bab.; Darius II, 4th year = 421/20 Egyptian, 420/19 Jew.-Bab.; *idem,* 8th year = 417/6, Egyptian, 416/5 Jew.-Bab.; *idem,* 9th year = 416/5 Egyptian, 415/4, Jew.-Bab.; *idem,* 13th year = 412/1 Egyptian, 411/0 Jew.-Bab.; *idem,* 14th year, 411/10 Egyptian, 410/09 Jew.-Bab. The difference between the Egyptian and the Jewish-Babylonian dating as here exhibited is caused, of course, by the difference in year-forms above developed. This will serve to explain the similar difference between the dates of the Ptolemaic canon and those of the documents, as exhibited in parallel columns below.

To make these fixed points of use for the intervening space or spaces, it is further necessary to establish the continuity of the years given between these points, or their lack of continuity, finding as nearly as possible the points at which the breaks occur. In the case of documents dated by monarchic reigns, like those under consideration, it is not necessary in order to establish continuity to have a document or date for each year, as it would be in the case of an annually changing eponymate. All that is really needed is the first year of a king's reign and his last, correctly enumerated and equated with the successor's accession year. This looks like a simple enough process. And so, in fact, in most instances it is. Before proceeding, however, to the development of this phase of the evidence, it becomes necessary once more to take issue with Ed. Meyer upon a point of method in procedure, where it would seem the master had nodded. He constantly speaks and reckons (*Forsch., loc. cit.*, esp. p. 473 for Cyrus and Cambyses, and 483 for Artaxerxes I) as though the proper way to establish the actual end of a king's reign were to find the last document dated under him. That this is not the case, we have now proof positive in documents, some of which Ed. Meyer did not have. These are the documents from Artaxerxes I's 41st year = Darius II's accession year. They show that the year 41 meant is not, as Meyer had assumed, by the antedating process the year 425/4, the year previous to Darius' accession, but Darius' accession year itself, which can be no other than 424/3. Now we know that actually, between the death of Artaxerxes and the accession of Darius, some 8–9 months intervened (Xerxes II and Sogdianus, cf. the histories, e.g., Meyer, *Forsch.* V, 482 f.). Yet there can now be no question that people continued throughout these 8 or 9 months after his death to date by Artaxerxes. And not only that, but even after people had recognized Darius' accession and begun to date by him—the first such dates being one on Šebaṭ 4 and two on Šebaṭ 15—another tablet slips in on Šebaṭ 17 which dates by Artaxerxes alone (cf. Clay, *op. cit.*, 2). This shows that the thing of prime importance in finding from documents using the postdating method the boundaries between kings, is not the last date of the predecessor, but the first date of the successor; that we cannot say: The last document dated by this king bears this date, therefore he must have reigned until this date or very nearly so, but what we can say, is: This is the first date by this king, therefore his accession cannot be later than this; that we must expect the datings by the predecessor to overlap into the successor's reign, while the reverse, in the case of regular succession after the demise of the predecessor, cannot be true (the case of an insurrection and of divided allegiance is only a seeming exception). Analogous to this is the way in which not a few people will slip 1909 dates into the first days of 1910, but very few indeed will date 1910 in the last days of 1909. In other words we must always reckon with the possibility, in fact, we must rather frequently expect to find, that after the accession of a new king, some people, because they had not heard or did not believe the news of the old king's demise or of the new one's accession, or because they feared the new one was a pretender, or simply because they made a mistake, would still continue to date by the old king, of whom they were sure, and to whom they had grown accustomed.

Proceeding now with our investigation, we find quite what was to be expected, with the wealth of material on hand, namely, not only are there no lacunae, but there is an actual surplus for the intervening space between the fixed points above indicated. Between the accession year of Cyrus, 539/8, and the 7th year of Cambyses, 523/2, lie 15 years. Six of these must be given to Cambyses, making his first year 529/8. Cambyses' accession must have taken place in 530/29. This leaves 9 years for Cyrus. And 9 years is what the bulk of the tablets dated after him give to Cyrus. The continuous series of Cyrus tablets run to Tammuz 7th of his 9th year. The first accession year tablet of Cambyses in our possession is dated Ab 12. Between these two dates in the year 530 the accession of Cambyses would seem to have taken place. But there is a small number of further dates which point to disturbed and unusual conditions in connection with this accession. The Cambyses tablets Nos. 35, 42, 46, 81 are dated in the first year of Cambyses, king of Babylon, but connect the name of Cyrus with that of Cambyses, two of them by means of the formula, "while Cyrus his father was king of the lands." Further, there is certainly one (Strassmayer, *Leyd. Cong.* No. 17, dated Adar 12) and possibly another (the celebrated Cambyses No. 97; cf. Meyer, 472, note 1; but see also Prašek, *Forschungen*, I, 25) dated in the 10th year of Cyrus. This evidence, especially in view of the fact that Cyrus probably did meet his death on a distant and dangerous expedition into the Northeast (so much, at least, of Herodotus' story, I: 211–14, may very well be true) does seem to be best interpreted by Meyer and the older men as pointing to a somewhat unusual procedure on the part of Cyrus, namely that on the eve of his departure he appointed Cambyses as viceroy and as successor in case of his own death. Whether the tablet Cyrus No. 16, which seems to be dated in the first year of Cyrus, king of the lands, "while Cambyses was King of Babylon," is simply a clumsy, bungling attempt of the scribe to designate the same state of affairs as the others, or whether it actually refers to another similar act on the part of Cyrus in his first year, 538/7, is not easy to decide. Its isolation makes the first explanation rather more probable, yet the Nabonidus Chronicle (Col. IV, ll. 24–28) makes it highly probable that at the Zagmuku festival, 538, Cambyses acted as Cyrus' representative in Babylon. But the further deduction of Meyer, that on account of the date on the tablet, Strassmayer, *Leyd. Cong.* No. 17, Cyrus cannot have met his death before Adar 12, 528, is certainly wrong, as has been shown above. Be it that his army was as signally defeated as Herodotus says, and that only a straggling remnant with uncertain news reached home, or be it that the bulk of the army remained in the field in spite of Cyrus' death, or whatever way one will, if Cyrus actually died in a far and unknown land, it is not at all surprising that the news of his death should be slow to be disseminated and accredited at home in Babylon. All that can be said on the basis of the evidence now in hand is that Cyrus' death probably occurred somewhere between Tammuz 27, 530 and Adar 12, 528.

The next interval, that between the 7th year of Cambyses, 523/2, and the 15th year of Xerxes, 471/0, is not so easily filled in. This is an interval of 51 years. To cover it we have tablets dated in the 8th year of Cambyses, tablets of the accession year and the first year of Smerdis (Barzia-Gaumata), tablets which probably reckon by the accession year and the first year of Nebuchadrezzar III, Nidintubel, tablets of Darius I, accession-year 36, and Xerxes' accession-year 5, probably 9. It is, of course, purely accidental that no tablets from the following years are extant. A new find any day may bring such dates to light, as the Aramaic finds in Egypt have given us Xerxes' 15th and 21st years. But, tablets or no tablets, we must unquestionably count 14 Xerxes years between his accession and his 15th year. Now it is perfectly obvious that some of these dates must be synchronous, for, if they followed each other in regular succession, as the dates of predecessor and successor, the accession year of the successor being always simply equated with the last year of the predecessor, this would give us a total of 53 years. It is quite clear, furthermore, which are the disturbing elements—the pretenders Smerdis and Nidintubel.[6] That the latter's accession and first year are synchronous with the same dates for

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[6] The other pretenders of the Behistun inscription, etc., are passed over as irrelevant in this connection. It is doubtful whether any contract tablets at all were dated after them, while the data of the Behistun inscription leave no room for doubt that they fall within Darius' reign.

Darius I, the Behistun inscription places beyond doubt. There remains only the problem of Smerdis. On the exact position of his reign the data of the Behistun inscription are not so clear. One thing, however, they do establish with perfect clearness, and that is that Darius' accession cannot precede, but must succeed immediately, the death of Smerdis. Darius' accession year = Smerdis' last, i.e., his first year. Which is Darius' accession year? The serene flow of the years of Darius I, once he had established his rule, and of Xerxes I (in whose reign the little revolution of Šamaširba scarcely created a ripple; cf. Meyer, *Forsch.* V, 476 f.) leaves no doubt as to this. Counting back, simply, from 471/0 as the 15th year of Xerxes, 14 years for Xerxes and 36 years for Darius, we arrive at 522/1 as the accession year of Darius. But 522/1 is plainly also Cambyses' 8th year. Smerdis' first year is synchronous with Cambyses' 8th year; his accession year, from the Iyyar of which we have one tablet, is Cambyses' 7th year, 523/2. In the early months of 523, the Adar preceding Nisan 1, the revolt was begun; after Nisan 1 Smerdis announced his accession. This tallies well, as Prašek has seen, with the data of the Behistun inscription and with the course of history. Adar 523, precisely when Cambyses was farthest away, on the disastrous march to Ethiopia, was a most auspicious time for Smerdis to inaugurate his revolt. During the year 523/2 the effects of the disaster in the far south and the unrest in Egypt would keep Cambyses occupied. During the year 522/1 (probably in Ab = July-August) Cambyses died on his way to suppress the revolt. Thus the evidence of the Aramaic papyri confirms the results of Prašek's brilliant investigation (Prašek, *Forschungen,* I, 18–30). Against this contemporary evidence the secondary statements of Herodotus (best explained by Prašek, *loc. cit.*) cannot stand. And Meyer's deductions, *Forschungen,* II, 472 f., cannot stand. The two lone tablets of the 8th and 11th months of Cambyses' 8th year do not prove that he lived until then. The course of events, as above set forth, makes that quite impossible. That careful or timid souls in this year of pretenders and revolutions and murders should have found it wisest and safest to date by the old king until the situation and the news cleared somewhat, is not at all surprising. And not only in the matter of Cambyses' death is Meyer at fault, but because he did not recognize the true state of affairs in regard to Smerdis' revolution, his dates for Smerdis, for Darius throughout, and those for Xerxes' accession are all one full year too late. Hence his troubles with the Ptolemaic canon and the documents, as above outlined. These troubles vanish completely, as does the supposed difference between the dates of the canon and the documents, with the interpretation of the evidence just given, the correctness of which appears most clearly in the new light shed upon it by the Egypto-Aramaic papyri. For the rest, throughout the remainder of Xerxes' and Artaxerxes I's reign, all is fairly plain sailing, until we come to the date of Artaxerxes' death. Here the concise brevity of Thucydides (IV: 50) in connection with a mistaken conception of the dates furnished by the documents (the assumption of antedating places all the dates one full year too early) seems again to have betrayed Meyer into error. Meyer assumes as certain that Artaxerxes died December, 425, or January, 424. Now, however, we know that the 41st year of the documents is not, as Meyer thought, 425/4, but 424/3. It would appear strange in itself, if Artaxerxes had actually died some two months before the beginning of the year 424/3, that people should have gone on dating by him almost throughout this entire year (the dates run continuously to Šebat 17), completely ignoring his son Xerxes II, who would in this case have had both an accession year and a first year. But in addition to this such historical data as we have for this period make it fairly certain that Meyer's date is some months too early. Diodorus, whose information at this point is rather full, has a note (XII: 71) giving as the length of Xerxes II's reign 2 months and that of Sogdianus 7 months. Now the first accession tablet of Darius II is dated Šebaṭ 4. This makes it certain that Darius' accession cannot have taken place later than this. And the fact that we actually have a tablet dated after Artaxerxes alone on Šebaṭ 3 makes it rather probable that Darius' accession was not much earlier, say at the beginning of Šebaṭ (cf. Clay, *loc. cit.*). Allowing, between this and the death of Artaxerxes, for the 9 months of Diodorus gives the end of Nisan, March/April, 424, as the most probable date for the old king's demise. This makes intelligible the attitude of the documents in completely ignoring the brief reign of Xerxes II and that of the unpopular Sogdianus, who was probably never recognized in Babylon and vicinity. And in the light of this evidence, it is doing no violence to Thucydides' statement to stretch his *ὕστερον* and his *κατὰ τοῦτον τὸν χρόνον* over a somewhat longer period of time than Meyer allows. For the reign of Darius II, there is only one further passage in Thucydides (VIII: 58) which causes a little trouble. He gives there the text of a treaty concluded in c. February, or possibly March, 411, between Tissaphernes and the Lacedaemonians and dated in the 13th year of Darius. Five explanations are possible: (1) Tissaphernes, in his dealings with the Greeks, may have adopted the Greek year-form, counting the year as beginning September-October, instead of in the following March-April. (2) Little time need be allowed to make the time of the conclusion of the treaty fall very near the actual beginning of Darius' 13th year in March-April. (3) The treaty may have been concluded with the understanding that it was to go into effect only with the beginning of Darius' 13th year. (4) The wily Tissaphernes may have allowed the Greeks to think of the year as beginning the previous October, while for him it would not begin until 6 months later; or (5) finally, the most probable explanation may be that promulgation or publication was delayed until after the beginning of Darius' 13th year. At any rate this statement, after all secondary, cannot overthrow the first-hand information of the cuneiform and Aramaic documents. These, it is true, carry us in the Murašu tablets only through the 13th, in the Aramaic business documents likewise through the 13th, in the Berlin papyri through the 17th year of this king. But as to the position of these years their testimony is clear. And that Darius II actually lived to see his 19th year, 405/4, the statement of Diodorus (XIII:108) and of the Ptolemaic canon leaves no room to doubt. Nor need any other, at best but secondary, information of Manetho or Christian chronographers or Greek historians, as at present known, be considered.

Below is given, first a conspectus in parallel columns of (*a*) a king's canon derived from the documents; (*b*) the Ptolemaic canon; (*c*) an 18-year list from Parthian times (cf. Meyer, *Forsch.* II, 856; Strassmayer, *ZA*, VII:199 and VIII:16) and then a list of actual dates, established as probable or certain by the above examination.

a	*b*	*c*
Cyrus (alone), 9 years, Nisan 1, 538–ult. Adar, 529	Cyrus, 9 years, January 5, 538–January 2, 529	[8] Cyrus 18=531/0
Cambyses, 8 years, Nisan 1, 529–ult. Adar, 521	Cambyses, 8 years, January 3, 529–December 31, 522	
[? Cyrus 10=Cambyses 1, Nisan 1, 529–ult. Adar, 528]		
[Smerdis, 1 year=Cambyses 8, Nisan 1, 522–ult. Adar, 521]		
Darius I, 36 years, Nisan 1, 521–ult. Adar, 485	Darius I, 36 years, January 1, 521–December 22, 486	9 Darius 18=513/2 27 Darius 18=495/4
[Nidintubel, 1 year=Darius I, 1, Nisan 1, 521–ult. Adar, 521]		
Xerxes, 21 years, Nisan 1, 485–ult. Adar, 464	Xerxes, 21 years, December 23, 486–December 16, 465	9 Xerxes 18=477/6
Artaxerxes I, 41 years, Nisan 1, 464–ult. Adar, 423	Artaxerxes I, 41 years, December 17, 465–December 6, 424	6 Artaxerxes 18=459/8 24 Artaxerxes 18=441/0
Darius II, 19 years, Nisan 1, 423–ult. Adar, 404	Darius II, 19 years, December 7, 424–December 1, 405	[1 Darius 18]=423/2 19 Darius 18=405/4

LIST OF ACTUAL DATES

539	October, Cyrus captures Babylon.
530	July/August, Cambyses appointed king.
529	(probably) Cyrus dies in the far northeast.
525	Cambyses conquers Egypt.
523	March, Smerdis revolts; Cambyses on the campaign against Ethiopia.
	March/April, Smerdis assumes title and throne.
522	July/August, Cambyses dies.
	October, Smerdis killed; Darius assumes the crown; Nidintubel, pretender in Babylon.
486	Darius dies. Xerxes king.
	(The change of rulers probably took place late in 486.)
465	Summer, Xerxes killed; Artaxerxes king.
424	March/April, Artaxerxes dies. Xerxes II.
	May/June, Xerxes II dies. Sogdianus.
423	January, Sogdianus killed. Darius II.
404	Winter or early spring, Darius II dies.